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Psychosocial Predictors of Military Misconduct

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Abstract: The objective of this longitudinal study was to determine psychosocial predictors of military misconduct in a cohort of Marine Corps war veterans. The study included data from 20,746 male Marines who completed a life history questionnaire during initial basic training and were subsequently deployed to a combat zone. Associations between psychosocial variables, psychiatric diagnoses, and subsequent misconduct outcomes were analyzed using Cox proportional hazards regression. The strongest predictors of misconduct outcomes (bad conduct discharges and military demotions) were psychiatric diagnoses and young age at first combat deployment. The results indicate that combat-related psychological disorders may manifest in numerous harmful ways, including impulsive, disruptive, and antisocial behavior. We recommend that the association between misconduct and psychiatric disorders be more explicitly acknowledged in research and treatment efforts involving military war veterans and other trauma victims.

Key Words: Antisocial behavior, psychiatric disorders, military populations, misconduct, Iraq/Afghanistan wars, veterans, combat.

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Military personnel who have deployed to combat zones have increased rates of mental disorders, including post-traumatic stress disorder (PTSD; Hoge et al., 2004; Hoge et al., 2006; Smith et al., 2008). While the Department of Defense has taken concrete steps to reduce the incidence and impact of PTSD, this intense focus on PTSD and related mental health problems may cause other sequelae of combat exposure to be overlooked. Of particular concern are breakdowns in professional conduct and antisocial behavior. Anecdotal and some empirical evidence suggests that antisocial behavior and misconduct occur more frequently in service members who have spent time in combat zones, but this issue has not yet been evaluated comprehensively in contemporary service members who have served in combat zones.

There is considerable historical evidence that exposure to combat may be associated with subsequent antisocial behavior. In the National Vietnam Veterans Readjustment Study (Kulka et al., 1990), almost half (46%) of the veterans reported having performed at least one violent act during the past year. Yager et al. (1984) found that when preservice background factors were controlled, combat exposure showed a significant association with postwar

arrests and convictions. Beckman et al. (1998) observed a significant association between exposure to atrocities during the Vietnam war and interpersonal violence. Similarly, Resnick et al. (1989) found that combat exposure was linked to postmilitary antisocial behavior in a sample of Vietnam veterans. Another study of Vietnam veterans (Barrett et al., 1996) found that level of combat exposure was significantly associated with a pattern of adult antisocial behavior. A study of a large sample of Gulf War veterans (Black et al., 2005) found a modest association between combat experience and subsequent incarceration.

PTSD may play a role in associations between combat and misconduct since numerous studies report significant associations between PTSD symptoms and postmilitary antisocial behavior (e.g., Hartl et al., 2005; McFall et al., 1999; Miller et al., 2003; Miller et al., 2004). In a sample of Vietnam veterans, “internalizing” and “externalizing” subtypes of combat-related PTSD were identified (Miller et al., 2003). Internalizers had high rates of depression and panic, whereas externalizers had high rates of antisocial personality traits and alcohol-related problems. There were similar results in a mixed sample of veterans from Vietnam and other conflicts (Miller et al., 2004). It may be that some individuals affected by trauma become withdrawn, whereas others respond with disruptive and antisocial behavior.

There is also evidence that a variety of mental disorders in the military may be closely linked with misconduct (Black et al., 2005; Hoge et al., 2005). Hoge et al. found that Army personnel who were hospitalized for mental disorders during active duty were significantly more likely to be involuntarily discharged from the Army for misconduct and other legal problems; mental disorders were also significantly associated with unauthorized absences. A study of a large Navy sample (Booth-Kewley et al., 2002) found self-reports of preservice depression and anxiety to be predictive of military discharge due to behavioral problems and misconduct. This study also found substantial overlap between mental health hospitalizations during active duty and early attrition. Some civilian literature points to a positive association between psychiatric problems and misconduct (Ulzen and Hamilton, 1998; Vermeiren, 2003).

The overlap between combat exposure, mental disorders, and misconduct in military members deploying to contemporary combat zones (Iraq or Afghanistan) has not been thoroughly addressed. The objective of this prospective longitudinal study was to determine the associations between life history and other psychosocial factors and subsequent misconduct in a large cohort of Marines who had deployed to a combat zone.

METHODS

Participants

The study sample consisted of 20,746 active-duty male Marines who entered the military between 2002 and 2004 and who deployed to a combat zone (e.g., Iraq, Kuwait, or Afghanistan) in support of Operation Enduring Freedom (OEF) or Operation Iraqi Freedom (OIF) between December 1, 2002 and September 30, 2007. The observation period started at time of entry into the Marines (between June 2002 and December 2004) and continued until the participant had a misconduct event, died, left the service, or the

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observation period ended (September 30, 2007). This sample was studied over the course of a 64-month (maximum) observation period.

Measures

The longitudinal database created for this study was based on 2 sources: (1) an archival set of Recruit Assessment Program (RAP) questionnaire data and (2) demographic, personnel, and medical data from the Career History Archival Medical and Personnel System (CHAMPS). RAP records were extracted for all active-duty enlisted Marines who entered the military between June 2, 2002 and December 19, 2004, and the social security numbers for this sample were cross-referenced with the CHAMPS database maintained by the Naval Health Research Center (NHRC). Because the purpose of the study was to examine the effects of psychosocial variables on misconduct in individuals who had been deployed to a combat zone, individuals who had not been deployed to either Iraq, Afghanistan, or Kuwait were excluded. This resulted in a sample of 20,746 Marines who had deployed to a combat zone in support of OIF or OEF.

RAP Questionnaire

The RAP questionnaire is a self-administered instrument that assesses Marine recruits' medical and psychosocial histories. For the purposes of this study, the RAP questionnaire provided precombat self-report data. The RAP survey was developed by the Department of Defense and other government agencies to evaluate the health effects of military service. Since June 2001, this questionnaire has been administered to the majority of Marine recruits trained in San Diego at the start of basic training. Because only men are trained in San Diego, data are collected for male recruits only.

The RAP questionnaire was administered to recruits during the first few days of their 12-week basic training program. After receiving an explanation of the RAP study aims and procedures, recruits were invited to participate. All participants gave written informed consent prior to participation. Participation was voluntary and military unit commanders were not present during questionnaire administration, which was performed by civilian researchers. The RAP survey was not anonymous. To allow for a possible follow-up assessment, participants were asked to provide their social security numbers and names. Potential participants were assured that all data would be kept completely confidential and no one in their chain of command would ever see their data. All research procedures were approved by the NHRC Institutional Review Board.

Most of the RAP questions were derived or adapted from other survey instruments, including the SF-36 Health Survey (Ware and Sherbourne, 1992), the Adverse Childhood Experiences Study (Anda et al., 1999; Dube et al., 2002), and the Conflict Tactics Scales (Straus and Gelles, 1990). Since June 2001, 4 different versions of the RAP questionnaire have been in use. The data for the present study are from RAP versions 2, 3, or 4 (which were very similar) (Lane et al., 2002).

We selected variables from RAP based on theoretical or empirical reasons for expecting an association with misconduct. The following variables were included as predictors: education level, smoking, family conflict, anger, reasons for joining the military, typical alcohol consumption, age at first alcohol consumption, age at first sexual intercourse, lifetime trauma, social support, whether parents were divorced or never married, religious attendance, and prior emotional problems. All data from the RAP represent preservice information, since the data were provided by Marines in the sample at the start of military basic training.

In general, scoring of variables (e.g., summing of scale items) followed precedents set by the RAP investigators during several years of prior research (Lane et al., 2002; Young et al., 2006a;

Young et al., 2006b). Education level was assessed from an item asking, "What is the furthest you have gone in school?" Responses were coded into 3 categories: general educational development credential, high school graduate, and some college or a college degree. Preservice smoking was based on an item that asked, "In the year before entering the military, did you smoke cigarettes?" Those responding, "not at all," were coded nonsmokers, and those responding, "some days," or "every day," as smokers.

Preservice family conflict was based on the following items: "While you were growing up, before age 17, how often did a parent or other adult living in your home: (1) Swear at you, insult you, or put you down, (2) Push, grab, shove, slap, or throw something at you, (3) Push, grab, shove, slap, or throw something at each other?" Response options were, "never," "once/twice," "sometimes," "often," and "very often," corresponding to a 0 to 4-point scale. Responses to the 3 items were summed, and family conflict was coded as either low (sum <2) or high (sum ≥2). Lifetime trauma was considered present if the respondent endorsed any one of the following: "You were in an accident where you could have been killed but were not badly hurt," "You were in an accident where you were injured and had to spend at least one night in the hospital," "You saw a close family member or friend being badly injured or killed," "You saw a stranger being badly injured or killed," "You were seriously attacked, beaten up, or assaulted," "You were threatened with a knife, gun, club, or other weapon," or "You were raped (someone forced you to have sex against your will)."

The variable that assessed whether the participant was raised by a parent who was divorced or never married was measured using an item that assessed the marital status of the participant's parents. Participants who indicated that their parents were divorced or had never married were coded as 1; all others were coded as 0. Social support was based on the RAP question, "How many close friends or relatives do you have that you can call on for help or talk to about personal problems?" Participants who reported having 3 or more close friends or relatives were coded as high (1); all others were coded as low (0). Religious attendance was based on a question that asked, "How often do you attend church, synagogue, or other religious gathering?" with 5 response options ranging from "almost never" to "more than once a week." Participants who reported attending church once a month or more were coded as high (1); all others were coded as low (0).

Anger was based on the item: "Do you sometimes get mad enough to hit, kick, or throw things?" Five possible response options were collapsed into 3 levels: none, medium, and high. Individuals responding "never," were coded as none, those responding "about once a year" were coded as low, and those responding "about once a month," "about once a week," or "more than once a week," were coded as high. Two yes/no questions regarding reasons for joining the military were extracted. Marines who indicated that they joined the military "for education and new job skills" were coded as 1; all others were coded as 0. Similarly, Marines who indicated that they joined the military "to leave problems at home" were coded as 1; all others were coded as 0. (Participants could endorse both reasons).

Typical alcohol consumption data came from the question, "During the year (12 months) before entering the military, how often did you have a drink containing alcohol?" Six possible responses were collapsed into 3 categories: none, low, and high. Individuals who responded "never" were coded as "none"; those who responded "once/twice" or "a few times" were coded as low (0), and those who responded "daily," "weekly," or "monthly" were coded as high (1). Age at first alcohol consumption was coded from the item, "How old were you when you first had a drink containing alcohol?" Six possible responses were collapsed into 3 categories: "15 or younger," "16 to 17," or "18 or older." Similarly, age at first sex was

coded from the RAP item, "How old were you when you had sexual intercourse for the first time?" Six possible responses were collapsed into 3 categories: "15 or younger," "16 to 17," "18 or older."

Career History Archival Medical and Personnel System

Data on Marines' career and medical histories were obtained from the CHAMPS database. CHAMPS, an electronic database maintained by NHRC in San Diego, contains personnel and medical information on all military personnel (Gunderson et al., 2005).

For the current study, predictor variables obtained from CHAMPS included age at military entry, race (white, African American, Hispanic, or other), total combat deployment time in months, age at first combat deployment, and score on the Armed Forces Qualification Test (AFQT). The AFQT is a test taken prior to entry into the military that is used by all US military branches to determine eligibility for military entry (Orme et al., 2001). It is a measure of general cognitive ability and correlates well with standardized tests of intelligence (Herrnstein and Murray, 1994). AFQT scores are reported as percentiles, and are standardized to have a mean of 50 and a standard deviation of 10. Scores on the AFQT reflect an applicant's standing relative to the national population of men and women ages 18 to 23. Currently, a score of 32 is the minimum AFQT score required for entry into the Marine Corps.

Combat deployment time, age at first combat, and AFQT scores were divided into tertiles, based on the distribution of these variables.

Outcome Measures

Outcome measures were also obtained from CHAMPS. The 2 outcomes for the study were bad conduct discharges from the military and demotions. The CHAMPS database provided reason for discharge using Marine Corps discharge categories. To be considered a bad conduct discharge, the service member had to have been discharged prior to the end of his enlistment term for disciplinary problems, criminal behavior, or persistent misconduct.

Psychiatric Diagnoses

Information on psychiatric diagnoses was also obtained from CHAMPS. Participants were defined as having a psychiatric disorder if they had an outpatient or hospitalization record during the observation period that included an International Classification of Diseases, ninth revision, clinical modification diagnostic code (ICD-9-CM) ranging from 290 to 316 (mental disorders), excluding 305.1 (tobacco disorders). These records originated from standard inpatient data record, standard ambulatory data record, and health care service record files via TRICARE Management Activity. These records are generated for military personnel at every inpatient and outpatient medical encounter, except for medical encounters that take place in the combat zone (e.g., Iraq, Afghanistan).

Service members who were diagnosed with more than one mental disorder during the study period were counted in every major diagnostic category that they represented. For example, an individual diagnosed with both an alcohol use disorder and a panic disorder was included in both the substance-related disorder and the anxiety disorder categories. An individual diagnosed with more than one subtype of anxiety disorder (e.g., panic disorder and PTSD) was counted for each subtype but was only counted once in the broad anxiety disorder category.

Using dates of combat and date of first psychiatric diagnoses, separate variables were created to reflect whether a participant had a precombat psychiatric diagnosis, a postcombat psychiatric diagnosis, or no psychiatric diagnosis. The precombat and postcombat psychiatric categories were mutually exclusive.

Statistical Analysis

The Cox proportional hazards regression model (survival analysis) was used to determine the effects of demographic and psychosocial predictors on the occurrence of 2 misconduct outcomes: bad conduct discharges and military demotions. The advantage of using survival analysis is that it allows data from all participants to be used in the calculation of the models, despite participants entering and leaving the military at different times. Survival time for each participant (the time variable used in the survival analysis) started at the time of entry into the Marines and continued until the participant had a misconduct event, died, left the service, or the observation period ended.

Separate models were developed to identify predictors of receiving (1) a bad conduct discharge from the military or (2) a demotion. Some individuals received both misconduct outcomes and are therefore represented in both models. For example, 23.6% of individuals who had been demoted received a bad conduct discharge. Average follow-up time was 46.7 months for the discharge model and 44.5 months for the demotion model.

The sample for the discharge model included 20,746 Marines. The sample for the demotion model consisted of 19,988 Marines. The samples for the 2 models are slightly different because some Marines ($n = 758$) were demoted prior to ever being deployed to a combat zone and thus were not appropriate for inclusion in postdeployment survival analysis. This situation did not occur for the discharge model, because by its very nature, discharge cannot logically occur prior to combat deployment.

Two predictor variables in the model (psychiatric diagnosis and combat deployment time) were treated as segmented time-dependent covariates. Psychiatric diagnosis was treated as a time-dependent covariate because the time interval between entering the military and receiving a psychiatric diagnosis (if applicable) was different for each participant. Similarly, combat deployment time was treated as time-dependent because combat deployment time accumulated at a different rate for each participant. Because months of military service was the time axis, all analyses controlled for service time.

In the Cox proportional hazards models, all demographics and all variables that were significant in the univariate analysis ($p < 0.05$) were entered as candidates into multivariate models. Before putting the variables into multivariate models, variables were assessed for collinearity and multicollinearity. The intercorrelations between the variables and the variance inflation factors were examined. No correlations were greater than 0.34 and no variance inflation factors were greater than 2.0, so it was concluded that substantial collinearity or multicollinearity was not present. The proportional hazards assumption for all predictor variables was examined by inspecting the cumulative distribution function plots and by testing the interaction terms between predictor variables and time. No statistically significant time-by-predictor interactions were found.

A substantial number of the RAP-based variables (e.g., anger, social support, religious attendance, and age at first sex) had nonnormal distributions, so collapsing response categories with very small cell sizes seemed prudent. To be able to analyze all of our study variables in a fairly consistent manner and to simplify presentation of results, many of the continuous or ordinal variables (e.g. AFQT, age at first combat deployment) are presented as dichotomous variables or as tertiles. For example, AFQT scores were divided into approximately equal tertiles, based on the score distribution.

RESULTS

The demographic characteristics of the sample are shown in Table 1. All participants were male enlisted Marines. Mean age at time of entry into the Marines was 19.4 years ($SD = 1.7$). Most

TABLE 1. Characteristics of Study Sample of Male Marines, Respondents Deployed During OEF/OIF, 2002–2007

Demographic Characteristic	Participants (N = 20,746)
Age at military entry (yr) (<i>M</i> ± <i>SD</i>)	19.4 ± 1.7
Accession yr	
2002	29.7%
2003	44.7%
2004	25.5%
Race/ethnicity	
White	68.3%
African American	3.5%
Hispanic	20.1%
Other	8.0%
Enlisted vs. officer (% enlisted)	100%
Education	
GED	2.7%
High school graduate	79.6%
Some college	17.7%
AFQT score	
≤51	36.0%
52–69	32.4%
≥70	31.7%

OEF/OIF indicates Operation Enduring Freedom/Operation Iraqi Freedom; GED, general educational development; AFQT, Armed Forces Qualification Test.

TABLE 2. Distribution of Psychiatric Diagnoses, Male Marines Deployed During OEF/OIF, 2002–2007

Diagnostic Category	Precombat Diagnosis ^a	Postcombat Diagnosis ^b
All mental disorders	1457	2835
Substance-related disorders	468	816
Adjustment disorders	254	352
Mood disorders	228	384
Personality disorders	67	93
Psychotic disorders	8	12
Anxiety disorders	153	777
Panic disorder	15	27
Generalized anxiety disorder	16	35
Obsessive-compulsive disorder	0	5
Phobias	3	4
Acute stress	25	74
Posttraumatic stress disorder	62	609
Anxiety, not otherwise specified	60	151
Somatoform/dissociative/factitious disorders	7	17
Other mental disorders	272	384

^aThis column shows all 1457 precombat psychiatric diagnosis diagnoses received by 1035 Marines in a sample of 20,746.

^bThis column shows all 2835 postcombat psychiatric diagnosis diagnoses received by 1928 Marines in a sample of 20,746.

OEF/OIF indicates Operation Enduring Freedom/Operation Iraqi Freedom.

participants had a high school diploma (80%). The sample was predominantly white (68%).

With regard to psychiatric diagnoses, a total of 14% of subjects received a psychiatric diagnosis during the observation

period (not shown). Specifically, 5% of the sample had a precombat psychiatric diagnosis and 9% had a postcombat psychiatric diagnosis. Although the majority (69%) of those who had a psychiatric diagnosis had 1 diagnosis, 20% had 2 diagnoses, 8% had three, and 3% had 4 or more.

The most common psychiatric diagnoses were substance-related disorders, anxiety disorders (including PTSD), mood disorders, adjustment disorders, and other mental disorders (Table 2). Examples of the latter category include specific subtypes of adjustment reaction, anxiety disorder, and depressive disorder.

The distributions of disorders were generally similar during the pre- and postcombat periods, with the exception of anxiety disorders and PTSD. Specifically, PTSD made up 21.5% of all postcombat psychiatric diagnoses, but it accounted for only 4.3% of all precombat diagnoses, *chi square* (1, *N* = 4292) = 215.55, *p* < 0.01. Similarly, anxiety disorders made up 27.4% of all postcombat psychiatric diagnoses, but only 10.5% of all precombat diagnoses, *chi square* (1, *N* = 4292) = 161.97, *p* < 0.01.

Regarding misconduct outcomes, 3% (*n* = 548) of the sample received a bad conduct discharge and 9% (*n* = 1726) received a demotion during the follow-up period. The most common reasons for receiving a bad conduct discharge were drug-related offenses (*n* = 340, 62%), frequent involvement with civil or military authorities (i.e., pattern of misconduct) (*n* = 88, 16%), and court-martial convictions (*n* = 66, 12%).

Predictors of Bad Conduct Discharges

The results of the univariate and multivariate Cox regressions to predict misconduct outcomes are shown in Table 3. Overall, 15 of the 19 variables examined as predictors of bad conduct discharges were significant in the univariate regression. The variables with the strongest associations with bad conduct discharges were age at first combat deployment and receipt of a psychiatric diagnosis. Other variables that had substantial univariate associations with bad conduct discharges included lower education level, lower AFQT score, African-American race, smoking, and younger age at first sexual encounter.

In the multivariate survival analysis, the 2 variables with the strongest associations with bad conduct discharges were age at first combat deployment and having received a psychiatric diagnosis (Table 3). Marines who first deployed to a combat zone at an older age (22 years or older) were at substantially reduced risk of receiving a bad conduct discharge (hazard ratio [HR], 0.13). Marines with either a pre- or postcombat psychiatric diagnosis were at greatly increased risk for being discharged for bad conduct compared with Marines with no psychiatric diagnoses. The HR associated with having a postcombat psychiatric diagnosis was substantial (HR, 9.0), indicating that Marines who received a psychiatric diagnosis subsequent to combat deployment were 9 times more likely to receive a bad conduct discharge than were Marines with no psychiatric diagnoses. Although precombat psychiatric diagnoses also predicted bad conduct discharges (HR, 1.9), this association was much weaker.

Combat deployment time had a significant association with bad conduct discharges, but the direction of this association was contrary to expectation. Marines with more time in theater were at reduced risk for a bad conduct discharge compared with those with less time (HR, 0.6 for the highest combat time category compared with the lowest).

Other variables that had strong predictive associations with bad conduct discharges in the multivariate model included education level, AFQT score, smoking, typical alcohol consumption, race, and younger age at first sexual experience. Education level was a strong predictor of bad conduct discharges. AFQT, a measure of general cognitive ability, was also a strong predictor of this outcome. Being

TABLE 3. Results of Cox Regression to Predict Bad Conduct Discharges and Demotions, Male Marines Deployed During OEF/OIF, 2002–2007

	Bad Conduct Discharges				Demotions			
	Univariate		Multivariate		Univariate		Multivariate	
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Age at first combat deployment (yr)								
19 or younger	1.00		1.00		1.00		1.00	
20–21	0.47**	0.39–0.56	0.41**	0.33–0.50	0.59**	0.53–0.65	0.54**	0.48–0.61
22 or older	0.22**	0.16–0.29	0.13**	0.09–0.19	0.37**	0.32–0.42	0.33**	0.28–0.39
Psychiatric diagnosis								
None (reference)	1.00		1.00		1.00		1.00	
Precombat diagnosis	2.18**	1.54–3.08	1.89**	1.25–2.84	1.92**	1.57–2.35	1.92**	1.54–2.39
Postcombat diagnosis	13.33**	11.09–16.03	9.00**	7.32–11.07	6.79**	5.95–7.76	5.24**	4.53–6.07
Race								
White	1.00		1.00		1.00		1.00	
African American	2.25**	1.64–3.07	2.00**	1.40–2.86	1.95**	1.60–2.38	1.84**	1.48–2.29
Hispanic	0.87	0.69–1.08	0.93	0.73–1.19	1.04	0.92–1.17	1.02	0.89–1.16
Other	0.88	0.63–1.22	0.98	0.68–1.39	1.01	0.84–1.20	1.05	0.87–1.28
Education								
GED	1.00		1.00		1.00		1.00	
High school graduate	0.44**	0.31–0.62	0.58**	0.40–0.84	0.54**	0.45–0.65	0.58**	0.46–0.74
Some college	0.29**	0.19–0.44	0.82	0.51–1.30	0.43**	0.35–0.53	0.72*	0.55–0.95
Combat deployment time								
Low (<7 mo)	1.00		1.00		1.00		1.00	
Medium (7–12.99 mo)	0.87	0.72–1.06	0.54**	0.43–0.67	1.06	0.95–1.19	0.77**	0.68–0.88
High (≥13 mo)	0.70*	0.51–0.94	0.62**	0.44–0.86	0.91	0.77–1.09	0.80*	0.66–0.97
AFQT score								
Low	1.00		1.00		1.00		1.00	
Medium	0.57**	0.46–0.69	0.59**	0.48–0.74	0.73**	0.65–0.81	0.74**	0.66–0.84
High	0.41**	0.33–0.52	0.56**	0.44–0.73	0.53**	0.47–0.60	0.65**	0.57–0.75
Smoking								
Nonsmoker	1.00	1.00	1.00		1.00		1.00	
Smoker	1.88**	1.59–2.23	1.47**	1.20–1.80	1.55**	1.40–1.70	1.34**	1.29–1.49
Family conflict level								
Low	1.00		1.00		1.00		1.00	
High	1.49**	1.25–1.78	1.27*	1.04–1.54	1.23**	1.12–1.36	1.08	0.97–1.20
Anger								
None	1.00		1.00		1.00		1.00	
Medium	0.79*	0.63–0.98	0.70**	0.55–0.89	1.00	0.88–1.12	0.99	0.87–1.11
High	1.28*	1.03–1.57	0.96	0.76–1.20	1.24**	1.09–1.40	1.05	0.92–1.20
Joined military for education and job skills								
No	1.00		1.00		1.00		1.00	
Yes	0.82*	0.69–0.97	0.93	0.77–1.12	0.81**	0.74–0.90	0.88*	0.79–0.97
Joined military to leave problems at home								
No	1.00		1.00		1.00		1.00	
Yes	1.67**	1.22–2.28	1.23	0.87–1.74	1.37**	1.13–1.66	1.31*	1.07–1.61
Typical alcohol consumption								
None	1.00		1.00		1.00			
Low	1.23*	1.01–1.50	1.34*	1.04–1.72	1.02	0.91–1.13		
High	1.39**	1.11–1.76	1.53**	1.12–2.09	1.06	0.93–1.21		
Age at first drink (yr)								
15 or younger	1.00		1.00		1.00			
16–17	0.98	0.80–1.22	1.21	0.96–1.54	0.90	0.80–1.02		0.68–0.86
18 or older	0.77*	0.62–0.95	1.36*	1.03–1.79	0.89	0.79–1.00		0.49–0.65

(Continued)

TABLE 3. (Continued)

	Bad Conduct Discharges				Demotions			
	Univariate		Multivariate		Univariate		Multivariate	
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Age at first sex (yr)								
15 or younger	1.00		1.00		1.00		1.00	
16–17	0.59**	0.49–0.72	0.67**	0.54–0.83	0.67**	0.60–0.75	0.76**	0.68–0.86
18 or older	0.35**	0.27–0.44	0.53**	0.41–0.69	0.45**	0.39–0.51	0.57**	0.49–0.65
Lifetime trauma								
Low	1.00				1.00		1.00	
High	1.18	1.00–1.40			1.11*	1.01–1.22	0.99	0.89–1.10
Parents divorced or never married								
No	1.00		1.00		1.00		1.00	
Yes	1.34**	1.13–1.59	1.14	0.95–1.38	1.16**	1.05–1.27	1.02	0.92–1.14
Religious attendance								
Low	1.00				1.00			
High	1.04	0.87–1.23			0.94	0.86–1.04		
Social support								
Low	1.00				1.00			
Medium	0.98	0.80–1.21			0.95	0.85–1.07		
High	1.05	0.85–1.29			0.90	0.80–1.02		
Preservice emotional problems								
Low	1.00				1.00			
High	1.33	0.97–1.81			1.18	0.98–1.42		

* $p < 0.05$.** $p < 0.01$.

OEF/OIF indicates Operation Enduring Freedom/Operation Iraqi Freedom; HR, hazard ratio; CI, confidence interval; GED, general educational development; AFQT, Armed Forces Qualification Test.

in the highest AFQT category (highest level of cognitive ability) significantly reduced a Marine's risk of being discharged for bad conduct (HR, 0.6).

Smoking and higher typical alcohol consumption increased a Marine's risk for receiving a bad conduct discharge (smoking: HR, 1.5; typical alcohol consumption: HR, 1.5 for the high alcohol use category). In addition, an association was observed between race and occurrence of bad conduct discharges: African-American Marines were over 2 times as likely as whites to receive a bad conduct discharge (HR, 2.0). Age at first sex was also a predictor of bad conduct discharges: Marines who reported first having sex at an older age (18 years or older) were at reduced risk for receiving a bad conduct discharge (HR, 0.5). Three other variables (family conflict, anger, and age at first drink) had significant associations with bad conduct discharges (Table 3).

Predictors of Demotions

The results of the univariate and multivariate Cox regression analysis to predict demotions are shown in Table 3. Overall, 13 of the 19 variables studied in relation to demotions were significant in the univariate analysis. As was the case for bad conduct discharges, the variables that were the strongest predictors of demotions were age at first combat deployment and receiving a psychiatric diagnosis. Education level, AFQT score, race, smoking, and younger age at first sex also had substantial univariate associations with demotions.

Consistent with the results for bad conduct discharges, the 2 variables that were the strongest predictors of demotions in the multivariate model were age at first combat deployment and receiving a psychiatric diagnosis (Table 3). Older age at time of first combat deployment (age, 22 years or older) substantially reduced a

Marine's risk of receiving a demotion (HR, 0.3). Receiving either a pre- or a postcombat psychiatric diagnosis was significantly predictive of receiving a demotion. The HR associated with having a postcombat psychiatric diagnosis was substantial (HR, 5.2). Precombat psychiatric diagnosis had a weaker but still significant association with demotions (HR, 1.9).

Combat deployment time was a significant predictor of demotions. Marines with less combat deployment time were actually at greater risk for receiving a demotion than those with more combat time (HR, 0.8 comparing the high and low combat time categories).

DISCUSSION

This study examined the predictive associations between life history, psychiatric diagnoses, and other psychosocial factors and subsequent misconduct in a cohort of Marines who deployed to a combat zone. The 2 variables with the strongest associations with both misconduct outcomes (bad conduct discharges and demotions) were age at first combat deployment and receiving a psychiatric diagnosis. Marines who first deployed to a combat zone at a relatively older age (age, 22 or older) were at substantially lower risk of receiving a bad conduct discharge or a demotion. Marines who had either a pre- or postcombat psychiatric diagnosis were at greatly increased risk for receiving a bad conduct discharge or demotion, compared with Marines with no psychiatric problems.

The associations between postcombat psychiatric diagnosis and misconduct were particularly strong. With a host of other variables controlled, we found that Marines who had a postcombat psychiatric diagnosis were 9 times as likely to receive a bad conduct

discharge and 5 times as likely to receive a demotion as Marines with no psychiatric diagnoses.

The fact that Marines who had received a psychiatric diagnosis were at greater risk for receiving a bad conduct discharge or a demotion is consistent with other military research studies linking mental disorders with antisocial behavior and legal problems (Black et al., 2005; Booth-Kewley et al., 2002; Hoge et al., 2005). In addition, this finding is consistent with civilian literature indicating a strong overlap between psychiatric problems and misconduct (Ulzen and Hamilton, 1998; Vermeiren, 2003).

The finding that Marines who deployed to combat at a younger age were at higher risk for misconduct is not surprising. We are not aware of any other studies examining age at first combat deployment in relation to misconduct, but a number of studies have found that younger age is associated with a greater risk of PTSD among combatants (Grieger et al., 2006; King et al., 1996; Seal et al., 2007). A study of former prisoners of war (Engdahl et al., 1997) found that younger age at capture was significantly predictive of PTSD. Another study found that regardless of their degree of combat exposure, men who were younger when they went to war were more likely to display postwar PTSD symptoms (King et al., 1996). Younger individuals may be less able to cope effectively with the traumatic experiences and pressures associated with being in a war zone, perhaps because they have less life and/or military experience.

A unique finding in the present study was that the associations between postcombat psychiatric diagnoses and misconduct were much stronger than the associations between precombat diagnoses and misconduct. These results suggest that mental disorders associated with combat may have implications that go far beyond the typical internalizing PTSD symptoms (e.g., anxiety and depression-related symptoms). Consistent with research by Miller et al. (2004), it is possible that combat-induced trauma may lead to externalizing problems involving impulsive, disruptive, and antisocial behavior. It may be that for some vulnerable individuals, combat-induced psychological trauma leads to breakdowns in personality, ethics, and self-control, a phenomenon that may be related to Shay's concept of moral injury in individuals who have experienced the horrors of war (Shay, 1994). More research is clearly needed to more fully understand the causal pathways from combat exposure to misconduct.

Combat deployment time was somewhat protective for bad conduct discharges and demotions. This may have been due to the "healthy warrior effect," in which individuals who are psychologically fit for service are more likely to reenlist and be retained in the military and redeployed to combat than their less psychologically healthy counterparts. Evidence for the healthy warrior effect has been found in other studies (Army Medical Surveillance Activity, 2007; Haley, 1998; Larson et al., 2008). More research is needed to identify the underlying reasons for this association.

The finding of a significant association between lower cognitive ability and misconduct is consistent with civilian literature linking lower intelligence with delinquency and antisocial behavior (Hirschi and Hindelang, 1977; McGloin et al., 2004). The finding that age at first sexual intercourse was a risk factor for misconduct confirms civilian studies that have found early sexual activity to be associated with a constellation of problem behaviors, including misconduct and delinquency (Schofield et al., 2008). The finding that smoking was predictive of misconduct is also consistent with past military (Booth-Kewley et al., 2002; Conway et al., 2007) and civilian research (Windle, 1990).

Race was also a risk factor for misconduct in this study. African-American Marines were significantly more likely than whites to receive a bad conduct discharge or a demotion. However, because we did not have information on the specific incidents that

resulted in the misconduct outcomes, our data cannot explain these ethnic differences in disciplinary rates.

One of the key findings of this study was the substantial overlap between psychiatric problems and misconduct. Although very few studies have examined this topic in a military population, this issue has important implications for military treatment providers and leaders. Our results strongly imply that military members (especially combat veterans) who engage in a pattern of misconduct should be screened and, if appropriate, treated for mental health disorders. Although many Marines in the present sample were diagnosed and treated for a psychiatric disorder, current policy does not require routine screening of Marines who exhibit behavioral problems. Another implication of our findings is that providers who treat Marine combatants with psychiatric disorders need to explicitly acknowledge and treat both internalizing and externalizing symptoms. The military may also want to consider expanding the current pre- and postdeployment briefings to include information on a broader array of behavioral problems that can present after combat.

Several limitations of this study should be noted. One weakness of the study was our lack of a comprehensive measure of combat exposure. Because information was available on the amount of time each participant spent in a combat zone, this was used as a proxy for combat exposure. However, because exposure to psychological combat trauma varies substantially across service members even when deployed to the same combat zone, it would have been desirable to also have a more direct assessment of participants' combat experiences. Also, because of the large sample size in this study, some variables that were significant in the multivariate models may have only been significant because of the large sample size and may have limited practical significance. In addition, this study used fairly simple operationalizations of complex phenomena (e.g., trauma, family conflict, and social support).

An additional limitation was that most of the predictor variables used in the study were based on self-report, with all of its associated limitations (e.g., response bias and socially desirable responding). A related limitation relates to possible underreporting on the RAP questionnaire. Given the fact that recruits completed the RAP instrument during their early days in basic training, they may have been reluctant to reveal information about themselves, possibly causing an underreporting of problems and negative behaviors. The RAP questionnaire was not anonymous, which also may have made participants reluctant to report problems. A final limitation of the study was our lack of access to psychiatric diagnoses made in the field during combat deployments but not recorded in data systems.

This study also has a number of strengths. We are not aware of any other longitudinal studies of military misconduct, or of any other studies examining risk factors for misconduct among contemporary combatants. Information on a large cohort of enlisted Marines provided a unique opportunity to identify psychosocial predictors of misconduct. Another unique feature of this study was the availability of preservice information on psychosocial variables (RAP questionnaire data) for a large cohort. These data allowed us to prospectively evaluate a broad range of potential predictors of misconduct.

CONCLUSIONS

The results of this study indicated that receiving a psychiatric diagnosis and younger age at first combat deployment were strong predictors of misconduct. Of particular importance was the strong association between postcombat psychiatric disorders and misconduct. Marines with a postcombat psychiatric disorder were 9 times as likely to be separated from service at a later date for behavioral reasons. These results suggest that a more intensive clinical focus

should be directed toward combat-exposed individuals who exhibit externalizing symptoms.

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